



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/751,930	12/29/2000	Hong Wang	884.366US1	7985

21186 7590 07/12/2004

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.
P.O. BOX 2938
MINNEAPOLIS, MN 55402

EXAMINER

DAS, CHAMELI

ART UNIT

PAPER NUMBER

2122

DATE MAILED: 07/12/2004

13

Please find below and/or attached an Office communication concerning this application or proceeding.

2

Office Action Summary

Application No.

09/751,930

Applicant(s)

WANG ET AL.

Examiner

CHAMELI C. DAS

Art Unit

2122

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 31-34 is/are allowed.
- 6) ☐ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

1. This action is in response to the RCE filed on 5/21/04.
2. Claims 1, 5, 13, and 23 have been amended.
3. Claims 31-34 have been added.

Claim Rejections - 35 USC § 112

4. Claims 1-12, 15-22, 24-26 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

With respect to claim 1, line 2, "mapping n-dimensional" is unclear because "n" is not specified as any integer or any number in the claims.

Claims 15, 16, 24, 25 and 26 are rejected for the same reasons.

The rejection of the base claims are necessarily incorporated into their dependent claims.

The examiner interprets "n", as "where, "n" is an integer, greater than 1".

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 13-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Connors et al, "Compiler Directed Dynamic Computation Reuse: Rationale and Initial Results", ACM, November, 1999.

As per claim 13, Connors discloses:

- creating an execution trace of the executable program (Connors, page 159, col 2, section: 2.1)
- compressing the execution trace to find recurrent portions thereof (Connors, page 161, lines 5-10, page 162, Figure 4, page 168, col 2)
- identifying the recurrent portions of the execution trace as reusable computation unit (Connors, page 164, col 2, section: 4.2).

For claim 14, (Connors, page 164, col 1, lines 1-27, page 164, Figure 6, page 166, col 2, section: 5.1).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1-7, 15-16, 18, 27 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Compiler-Directed Dynamic Computations Reuse: Rationale and Initial Results" written by Connors et al (Connors), published on IEEE in 1999 and further in view of De Greef et al (De Greef), US 6,078,745.

As per claim 1, Connors discloses mapping architectural state vectors, which are representative of instances of processor instructions (Connors, page 160, col 2, lines 28-46, "the mapping relation between the ... the reuse instruction can be implemented to use multiple recorded instances, allowing a large, number of instructions to be skipped for several input sets"). Connors discloses a method of identifying reusable computation (Connors, page 158, col 2, section A and page 162, col 1, section B), phrase of text and identifying recurrent phrases of text as reusable computation unit (Connors, page 158, col 2, section A, page 159, col 1, lines 1-36, page 165, col 1 and col 2 lines 1-2, page 168, col 2, section E). Connors discloses update the architectural state (page 162, section C and page 166, col 2, section D) and state vectors (page 166, col 1, lines 1-20).

Connors disclose mapping relation between input and output registers. Connors does not specifically disclose mapping multi-dimensional to one-dimensional. However, De Greef discloses mapping multi-dimensional symbol to plurality of one-dimensional symbol (De Greef, col 35, lines 10-15) and the vectors are the executed instruction (col 2, lines 42-55). The modification would be obvious because one of the ordinary skill in the art would be motivated to perform the computation simpler and faster.

For claim 2, (Connors, page 165, col 2, section Acyclic region formation, page 160, col 2, figure 2, page 160, col 1, lines 9- col 2, page 164, col 1, lines 1-28, page 159, col 2, section 2).

For claim 3, (Connors, page 160, lines 15-30, and col 2, lines 28-50).

For claim 4, (Connors, page 158, Abstract, page 160, col, 1, section: Block-level reuse).

For claim 5, (Connors, page 166, col 1, lines 5-10, page 164, col 1).

For claim 6, (Connors, page 167, col 1, figures (a), (b), page 168, col 1, page 161, col 2, section 2.3).

For claim 7, Connors discloses compression. Connors does not specifically disclose lossless compression. However, De Greef discloses lossless compression (De Greef, col 34, lines 62-67). The modification would be obvious because one of the ordinary skill in the art would be motivated to reduce the text or file size efficiently.

For claim 15, see the rejection of claims 1 and 3.

For claim 16, see the rejection of claims 1 and 5.

For claim 18, (Connors, page 164, col 2).

For claim 27, see the rejection of claim 7.

For claim 29, see the rejection of claim 17.

8. Claims 8-12, 17, 22, 28 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over the article "Compiler-Directed Dynamic Computations Reuse: Rationale and Initial Results" written by Connors et al (Connors), published on IEEE in 1999 and further in view of De Greef et al (De Greef), US 6,078,745 and official notice.

For claim 8, neither Connors nor De Greef disclose conjugate processor. However, official notice is taken for conjugate processor. The modification would be

obvious because one of the ordinary skill in the art would be motivated to perform the computation efficiently.

For claim 9, neither Connors nor De Greef disclose lossy compression. However, official notice is taken for lossy compression. The modification would be obvious because the system user does not want to preserve excess information and reduce the size of the data of file as little as 5 percent of the original size of the data.

For claim 10, (Connors, page 158, col 1, section Introduction, page 167, col 1, page 167, col 2, section: A, page 164, col 2, section A). For conjugate processor see the rejection of claim 8 above.

For claim 11, (Connors, page 164, col 2, section B).

For claim 12, (Connors, page 164, section 4.1, "Deterministic Computation, page 165, col 2, section: Acyclic region formation, page 169, section: summary, lines 1-5).

For claim 17, Connors discloses compression. Connors does not specifically disclose editing distance. However, official notice is taken for editing distance. The modification would be obvious because one of the ordinary skill in the art would be motivated to compare the cost of transforming the data from one state to another state.

For claim 19, see the rejection of claim 6.

For claim 20, (Connors, page 164, col 2, page 165, col 2).

For claim 21, see the rejection of claim 12.

For claim 22, see the rejection of claim 8.

For claim 23, see the rejection of claims 6 and 20.

For claim 24, see the rejection of claim 1.

For claim 25, see the rejection of claim 5.

For claim 26, see the rejection of claim 1.

For claim 28, see the rejection of claim 8.

For claim 30, see the rejection of claim 10.

Allowable Subject Matter

9. Claims 31-34 have been allowed.

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

TITLE: Multiprocessor computer system and method for maintaining cache coherence utilizing a multi-dimensional cache coherence directory structure, US 6633958 B1.

TITLE: Multi-dimensional selectivity estimation method using compressed histogram information, US 6311181 B1.

TITLE: High speed numerical integration method and system, US 6304888 B1.

TITLE: Creating a linearized data structure for ordering images based on their attributes, US 6,628,846.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chameli Das whose telephone number is 703-305-1339.

Art Unit: 2122

The examiner can normally be reached on Monday-Friday from 7:00 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor Tuan Dam can be reached at 703-305-4552. The fax number for this group is: (703) 872-9306.

An inquiry of general nature or relating to the status of this application or proceeding should be directed to the group receptionist whose telephone number is 703-305-9600.

Chameli C. Das
CHAMELI C. DAS
PRIMARY EXAMINER

6/30/09